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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,877	05/04/2001	Christof Faller	Faller 5	8364

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EXAMINER

PENDLETON, BRIAN T

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/848,877

Applicant(s)

FALLER, CHRISTOF

Examiner

Brian T. Pendleton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 7, 9-12, 16-19, 22-24, 27, 29, 30, 32 and 35 is/are rejected.
- 7) ☒ Claim(s) 3, 5, 6, 8, 13-15, 20, 21, 25, 26, 28, 31, 33 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/14/05 have been fully considered but they are not persuasive. Applicant has not given any arguments as to the patentability of claim 1 with respect to the Kobayashi reference. The rejection under 35 USC 102 is maintained.

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, 7, 9, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi. Kobayashi discloses a method and apparatus for localization of an acoustic image comprising band dividing filter 2 for dividing at least one signal into a plurality of three different frequency bands and signal processing unit 3 for applying two different sets of spatial parameters to the input audio signal in different frequency bands to generate two synthesized audio signals of an auditory scene. The spatial parameters are located in control portion 4. Two or more synthesized audio signals are produced from signal processing unit 3. Claims 1 and 17 are met. As to claim 4, either one of the input signals (1L or 1R) are processed through signal processing unit 3. For example, signal 1L is processed through 3L. The signal 1L therefore reads on a

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mono signal. As to claim 7, columns 3 and 4 teach that sound localization is frequency dependent. That information is determined through tests which determine the influence of time difference and sound volume on localization. Therefore, under a broad interpretation of the claim, dividing the input audio signal into a plurality of different frequency bands is based on the information generated from testing. As to claim 9, the spatial parameters are interaural level difference and interaural time delay (see column 6 lines 55-59).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 11, 12, 16, 17 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al, US Patent 5,889,843 in view of Knappe et al, US Patent 6,850,496. Singer discloses a method for creating a spatial auditory environment comprising audio input sensors 22, 24, 26 at sites 12, 14, 16, signal processor 30 and interface 40. As shown in figure 2, an auditory environment is synthesized based on the input from the audio input sensors at each site. The signal processor 30 includes audio mixers, and digital audio processors for composing the synthetic auditory environment and accomplishing spatialization (see column 4 lines 46-56). Singer thus applies one or spatial parameters to an input audio signal to generate two or more synthesized audio signals of an auditory scene, the audio signals being the sound sources of the sites. Singer does not disclose dividing the input audio signal into a plurality of frequency bands and applying the spatial parameters to the different frequency bands. Knappe

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discloses a system of audio conferencing 46 in figure 3 comprising a plurality of users (sound sources) and packet data network 32. The sound sources at endpoint A are processed to have each of the users in a specific sector 48, 50, or 52. Thus, the system accomplishes spatialization of the sound sources. Spatialization is detailed in figure 6 which comprises a channel mapper 96 and 98. As taught in column 7 lines 20-column 8 line 14, the channel mappers utilize interaural level differences and interaural time delays (spatial parameters) in order to spatialize the sound sources. For low frequencies, interaural time delay is the main directional cue and for high frequency interaural level difference is the main directional cue. It would have been obvious to one of ordinary skill in the art at the time of invention to use the channel mapping technique suggested by Knappe in the apparatus of Singer for the purpose of spatialization using a well known technique for locating sound sources in an auditory environment. Furthermore, it would have been obvious to apply different sets of spatial parameters to different frequency bands of an input audio signal since it improved the performance of a spatial representation of sound sources, as suggested by Knappe. One of ordinary skill in the art would have been motivated to divide the input audio signal of Singer into a plurality of frequency bands and apply interaural time delays to the low frequencies and interaural level differences to the high frequencies. Claims 1, 16, and 17 are met. As to claim 2, the sound sources are mixed by signal processor 30 and spatial parameters applied to the mixed signal. As to claim 4, the mixed signal by the processor 30 is a mono signal. Per claim 11, obviously left and right signals are produced by Singer since a binaural signal is output to the sites. Regarding claim 12, figures 3 and 4 of Singer illustrate three or more signals of a multi-channel audio signal for output at each site. As to claim 27, the

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combination obviously applies a spatial parameter as if the input audio signal is a single audio source since it applies the parameter to the mixed signal in processor 30.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al in view of Knappe et al as applied to claim 1 above, and further in view of Johnston et al, US Patent 6,845,163. The combination of Singer and Knappe does not disclose converting the input audio signal from a time domain into a frequency domain and converting the two or more synthesized audio signals from the frequency domain into the time domain. Johnston discloses that head related transfer functions are realized in the frequency domain. It was also well known that head related transfer functions were used to accomplish spatialization of audio signals also.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use head related transfer functions in the apparatus of Singer and Knappe as the spatial parameter to synthesize audio signals, said head related transfer functions requiring converting the input audio signal to the frequency domain and the synthesized audio signals being inverse converted from the frequency domain to the time domain.

Claims 18, 19, 22, 23, 24, 30 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al in view of Knappe et al and further in view of Johnston et al. As discussed above, it would have been obvious to combine Singer and Knappe for the purpose of applying a set of spatial parameters (interaural time delay and interaural level difference) to two or more frequency bands of an input signal to synthesize an auditory scene of two or more audio signals. The combination of Singer and Knappe does not disclose converting the input audio signal from a time domain into a frequency domain and converting the two or more synthesized audio signals from the frequency domain into the time domain. Johnston discloses that head

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related transfer functions are realized in the frequency domain. It was also well known that head related transfer functions were used to accomplish spatialization of audio signals also.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use head related transfer functions in the apparatus of Singer and Knappe as the spatial parameter to synthesize audio signals, said head related transfer functions requiring converting the input audio signal to the frequency domain and the synthesized audio signals being inverse converted from the frequency domain to the time domain. Regarding claim 30, the combination obviously applies a spatial parameter as if the input audio signal is a single audio source since it applies the parameter to the mixed signal in processor 30.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer in view of Knappe as applied to claim 1 above, and further in view of Curry et al, US Patent Application Publication 2003/0081115. The combination of Singer and Knappe does not disclose that the input signal is compressed audio signal and requires decompression. In the same field of endeavor, Curry discloses a spatial sound conference system comprising a compression unit and decompression unit for users 100 and 199. Therefore, it was well known to use compression when achieving teleconferencing. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Singer and Knappe to include compression for the purpose of conserving signal bandwidth on a telephone line.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer in view of Knappe and further in view of Johnston, as applied to claim 19 above, and further in view of Curry et al. The combination of Singer, Knappe, and Johnston does not disclose that the input signal is compressed audio signal and requires decompression. In the same field of endeavor,

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Curry discloses a spatial sound conference system comprising a compression unit and decompression unit for users 100 and 199. Therefore, it was well known to use compression when achieving teleconferencing. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Singer and Knappe to include compression for the purpose of conserving signal bandwidth on a telephone line.

Allowable Subject Matter

Claims 3, 5, 6, 8, 13-15, 20, 21, 25, 26, 28, 31, 33, 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (571) 272-7527. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian T. Pendleton
Primary Examiner
Art Unit 2644



btp